

Barriers to Accurate and Complete External Cause of Injury Coding – A Review of Interviews with Medical Coders

Report for the Surveillance Quality Improvement Project, North Carolina Division of Public Health

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Abstract

Objective: To assess medical coding professionals' knowledge, attitude, and practice in assigning codes for injury-related emergency department (ED) visits.

Background: The ED is an important source of morbidity data for the monitoring of injuries in North Carolina (NC). NC's statewide electronic disease surveillance system, the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT), includes *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) External Cause of Injury Codes (E-codes)*, for describing the mechanism of injury for ED visits (e.g. fall, motor vehicle collision, overdose, etc.). Although ED visits with an injury diagnosis code in the range of 800-999 should include E-codes, this is not always the case. As part of a broader multi-state project to improve E-coding of morbidity data, this surveillance quality improvement (SQI) project sought to describe the use and understanding of E-codes by medical coders in NC.

Methods: The NC SQI research team identified high-performing hospitals in which the majority of NC DETECT ED visits with injury diagnosis codes also contained E-codes. The NC SQI team then approached hospitals through community partners for participation in medical coder interviews. For hospitals that agreed to participate in interviews, medical coders were queried about the software used to assign E-codes, their knowledge of the use of E-codes in public health research, and the barriers they faced in regards to accurate and complete E-coding.

Results: NC SQI research staff conducted interviews with medical coders from four hospital systems. All coders agreed that a lack of clinical documentation was the principal reason for the failure to assign specific E-codes for injury-related ED visits. Although the medical coders were not fully aware of the research implications of including E-codes, they stated that they consistently reported E-codes as part of their professional training to adhere to the professional standards set by their institutions.

Conclusions: Interviews with medical coders indicated that these professionals attempt to include E-codes whenever possible, but can only do so if clinician documentation is adequate to assign a mechanism of injury. At this time, most of the interviewed coders represented large medical facilities in NC; therefore, the NC SQI team still needs to interview medical coders from smaller, more rural hospitals in order to capture a complete picture of injury coding in the state. In addition, public health has a duty to communicate to medical coders, and other health professionals, the necessity of E-codes for conducting injury surveillance and to provide examples of how these codes are used for public health surveillance and injury prevention in North Carolina.

Background

Injuries are an important cause of mortality and morbidity in North Carolina (NC) as well as in the United States (US). In 2011, the Centers for Disease Control and Prevention (CDC) reported that a total of 187,464 individuals died as a result of injury (rate of 60.2 deaths per 100,000 population). NC had 6,110 deaths with a rate slightly higher than the national average (63.3 deaths per 100,000 population).¹ In any given year, the number of nonfatal injuries dwarfs the number of fatal injuries. For example, in 2011 there were 1,115,582 injury-related emergency department (ED) visits in NC; a number 183 times greater than the number of deaths observed in that year.²⁻³ Although death is the most serious outcome associated with injury, nonfatal injuries have substantial costs related to the utilization of health-care resources for both acute and long-term treatment, the loss of productivity, and the diminishment of a patient's quality of life.⁴ Due to the sizeable burden associated with injury, it is important to have a comprehensive injury surveillance system to identify emerging injury problems and to monitor on-going injury trends.⁵

According to the CDC, "Public health surveillance is the ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation and evaluation of public health practice, closely integrated with the dissemination of these data to those who need to know and linked to prevention and control."⁶ Historically, much of public health surveillance focused on monitoring infectious diseases; however, in recent years, surveillance methods have been increasingly used to monitor injuries and chronic diseases.⁷ The most common statewide and national sources of injury surveillance data are vital statistics, since these data are collected by all states. Although mortality data has an extremely important function as part of a comprehensive state injury surveillance system, it is not sufficient for a number of reasons. As mentioned previously, nonfatal injuries outnumber fatal injuries by a considerable margin, and so for less populous states there may not be enough injury deaths to make meaningful conclusions in regards to injury prevention. In addition, the leading causes of fatal injuries may differ from the leading causes of nonfatal injuries.⁸ For example, the leading cause of injury death in the US is motor vehicle collisions; however, the most common cause of injuries treated in hospital EDs is falls.⁹⁻¹⁰ Both injury mechanisms are important in their own right, but require very different prevention strategies; therefore, it is important to take both mortality and morbidity data into account when setting community priorities.

One of the reasons that some states are less likely to use morbidity data for injury surveillance, is the lack of statewide hospital discharge, trauma, emergency medical services (EMS), and ED data. For example, only 31 states maintain statewide ED databases according to the Agency for Healthcare Research and Quality (AHRQ).¹¹

Among states that possess comprehensive ED data systems, the utility of the data for injury surveillance varies widely. This variability is due in part to the reliance upon External Cause of Injury Codes (E-codes) for the identification of injury mechanisms. According to the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*, E-codes are used to "...permit the classification of environmental events, circumstances, and conditions as the cause of injury, poisoning, and other adverse effects."¹² E-codes describe the intent of the injury (e.g. unintentional), mechanism of injury (e.g. fall from playground equipment), place of occurrence of injury (e.g. place for recreation and sport), and activity precipitating the injury (e.g. rough housing and horseplay).¹³ *ICD-9-CM* coding guidelines state that E-codes in the range of E800-E999 should be used in conjunction with injury diagnosis codes in the range of 800-999 (excluding code 995.9 for systemic inflammatory response syndrome).¹⁴ Although E-codes can provide vital information about the circumstances that precipitated an injury, according to a 2004 Council of State and Territorial

Epidemiologist's (CSTE's) survey of state health departments, only 55% of states that routinely collected E-codes felt that the E-code data were "extremely useful."⁸

There are multiple reasons why states may feel that E-code data are not useful for injury surveillance. One reason is lack of completeness. According to the CDC, the majority of state databases have incomplete E-code data. Unlike diagnosis codes, E-codes are not required for hospital reimbursement for services provided and their collection is not required by most states.¹⁵ In addition to incompleteness, E-codes data often lack specificity. A study of Washington State hospital discharge data observed that 20% of hospitalizations with E-codes belonging to the general categories labeled "other" and "unspecified" could be coded to a more specific injury mechanisms.¹⁶ Another potential limitation of E-code data is a lack of accuracy in correctly describing the circumstances resulting in an injury. A systematic review conducted by McKenzie et al. estimated that the accuracy of E-coding using ICD-9-CM ranged from 64% for exact code agreement (e.g. E880.0 – Accidental fall on escalator) and 85% for assessment of broader code groups (e.g. E880 – Accidental fall on or from stairs or steps).¹⁷ Errors in E-coding are correlated with greater length of stay, death as outcome, and type of injury mechanism (e.g. injuries due to surgical and medical procedures).¹⁸⁻¹⁹

NC is well-suited for an investigation into the quality of morbidity data for injury surveillance. In addition to statewide hospital discharge, trauma, and EMS data, NC collects statewide ED data as part of the NC Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT). NC DETECT captures near real-time electronic data from all 24/7 acute-care, civilian, hospital-affiliated EDs as mandated under NC General Statute § 130A-480.²⁰ As of July 1, 2014, NC DETECT captured ED records from 122 of 122 24/7 acute care, civilian, hospital-affiliated EDs in NC.

Although NC does not require EDs to collect E-codes, the majority of hospitals voluntarily collect E-codes for injury-related ED visits that contain an injury diagnosis code as per coding guidelines.¹³ In addition, NC DETECT captures E-codes under the NC mandate that hospitals provide all electronically collected ED visit data to the NC Division of Public Health (NC DPH) for public health surveillance purposes. However, the completeness, accuracy, and specificity of NC DETECT E-code data are unclear; therefore, NC DPH engaged in a CDC-funded project, the NC Surveillance Quality Improvement Project (NC SQI), to investigate NC DETECT ED data in detail.

NC SQI is a multi-pronged project with focuses on describing the completeness of E-coding in NC DETECT ED data, monitoring changes in the percent of injury-related ED visits that receive E-codes in NC DETECT ED data, working with hospitals to improve the electronic submission of data (including E-codes), developing injury surveillance case definitions for use with NC DETECT ED data, developing reports and fact sheets using NC DETECT ED data as a means of highlighting the utility of the data, and interviewing NC hospital coders to better understand the process of E-coding and to identify the challenges involved with assigning complete and accurate E-codes. This report describes the information garnered from interviews with NC hospital coders as of June 30, 2014.

Methods

This is an internal surveillance quality improvement initiative of the NC DPH in conjunction with the Carolina Center for Health Informatics (CCHI) of the Department of Emergency Medicine at the University of North Carolina at Chapel Hill (UNC-CH) and the Injury Prevention Research Center (IPRC) at UNC-CH. This report covers interviews conducted with medical coders between January 1, 2013 and June 30, 2014. This project is on-going and so this document summarizes the information obtained from interviews to date. The NC SQI project was considered exempt by the institutional review board at UNC-CH.

Characterizing E-code Completeness

As a preliminary step to conducting medical coder interviews, the NC SQI team described the completeness of E-coding of injury-related ED visits for the years 2011-2012 in NC DETECT ED visit data. An ED visit was classified as injury-related if it contained a diagnosis code in the *ICD-9-CM* range of 800-999 in any one of the 11 fields captured by NC DETECT. ED visits in which the only injury-related diagnosis code was 995.9 (systemic inflammatory response syndrome) were excluded from analyses, as this syndrome is not exclusive to injuries.¹⁴ Injury-related ED visits that were missing E-codes were stratified by patient demographics as well as other variables including reporting facility. These methods are described in further detail in the NC SQI reports: *A Report on the Completeness and Validity of External Cause of Injury Coding in North Carolina Emergency Departments as Relates to Diagnosed Injuries* and *A Report on the Completeness and Validity of External Cause of Injury Coding in North Carolina Emergency Departments as Relates to Diagnosed Injuries – 2012 Update*.²⁻³ The NC SQI team used this information to identify medical facilities for potential partnership in SQI activities including, but not limited to, medical coder interviews. In general, NC SQI selected facilities with high E-code completeness for participation in coder interviews so as to elicit information on best coding practices.

Identifying Partnering Facilities

The NC SQI team used a variety of approaches to contact medical facilities. In most instances, rather than initiating communication with the facilities directly, NC SQI collaborated with community partners and the NC Hospital Association (NCHA). Typically, the initial communication was conducted electronically. Once a facility expressed interest in participation in the NC SQI project, the facility was provided with a brief abstract giving a description of the project. Assurances were made to the facility that both the facility name and the names of the coders interviewed would be kept confidential.

Interviewing Partnering Facilities

NC SQI team members developed a series of questions to elicit the practices and opinions of medical coders with respect to the generation of E-codes (Appendix 1). These questions were provided to the coders prior to the interview. One or more research team members conducted a semi-structured interview to learn more about coding practices and procedures within the hospital and ED, using both prepared questions and providing opportunities for open feedback from coders. Since many of the coders worked remotely rather than at a central location, the interviews were conducted in different settings to accommodate the needs of the coders. The interviews were conducted individually, in small groups, and over conference calls. Coder responses are summarized in the results section.

Results

Completeness of E-coding By Medical Facility

This section provides a brief overview of the investigation into the quality of E-coding in NC DETECT ED data. A more thorough discussion of the results is presented in the reports: *A Report on the Completeness and Validity of External Cause of Injury Coding in North Carolina Emergency Departments as Relates to Diagnosed Injuries* and *A Report on the Completeness and Validity of External Cause of Injury Coding in North Carolina Emergency Departments as Relates to Diagnosed Injuries – 2012 Update*.²⁻³

NC SQI identified 950,245 ED visits with an injury diagnosis code in the range of 800-999 out of a total of 4.6 million ED visits in 2011. This number increased to 961,956 (out of 4.8 million ED visits) in 2012. In 2011, the percent of ED visits with an injury diagnosis code missing an E-code was 12.8%. The percentage missing decreased to 12.1% in 2012 (Table 1). In 2012, the percent of visits missing E-codes was not consistent across all demographic variables. Overall, patient age ≥ 65 years (18%), patient disposition of death (24%), patient disposition of hospital admission (28%), and expected source of payment of Medicare (15%) were associated with greater percent missing E-codes (data are not displayed). In addition, certain categories of injury diagnoses were associated with missing E-codes. These included injury to nerves and spinal cord (18%); other and unspecified effects of external causes (21%); late effects of injuries (22%), internal injuries of thorax, abdomen, and pelvis (23%); injuries to blood vessels (26%); and complications of medical care, not elsewhere classified (32%). (data are not displayed).

Table 1. Frequency of injury-related NC DETECT ED visits missing E-codes: NC, 2011-2012

Year	ED visits missing an E-code		No. ED visits with an injury diagnosis code ¹
	No.	%	
2011	122,038	12.8%	950,245
2012	116,227	12.1%	961,956

¹Defined as an ED visit with an ICD-9-CM diagnosis code in the range of 800-999 (excluding code 995.9)

One of the factors most closely associated with missing E-codes was reporting medical facility. Out of the 116 facilities reporting NC DETECT ED data in 2012, the percent of ED visits with injury diagnosis codes missing E-codes ranged from 0%-99% missing. Only eight facilities were missing E-codes for greater than 25% of injury-related ED visits and only four facilities were missing E-codes for greater than 50% of injury-related ED visits (Figure 1). This represented a remarkable improvement from 2011 in which twelve facilities were missing E-codes for greater than 50% of ED visits with injury diagnosis codes. Of the twelve poorest reporting facilities in 2011, only one facility demonstrated an increase in the percent of injury-related ED visits that were missing E-codes in 2012 (Figure 2).

Figure 1. Frequency of injury-related NC DETECT ED visits missing E-codes by reporting medical facility: NC, 2012

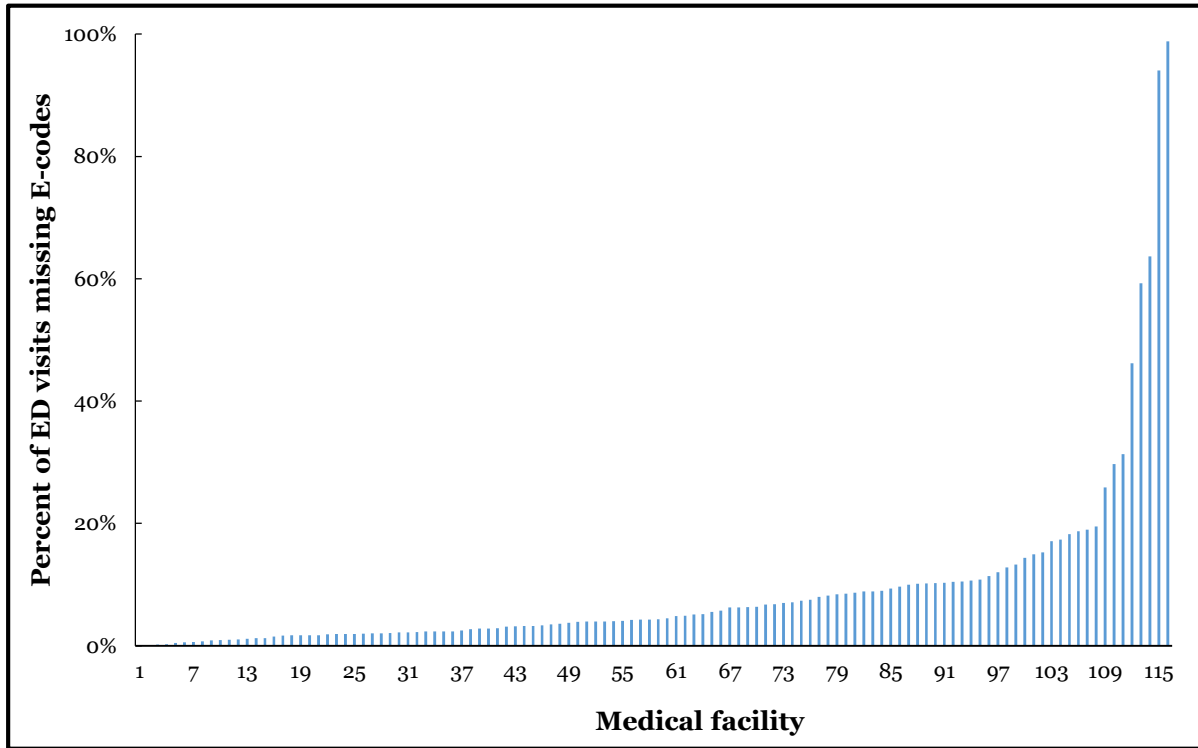
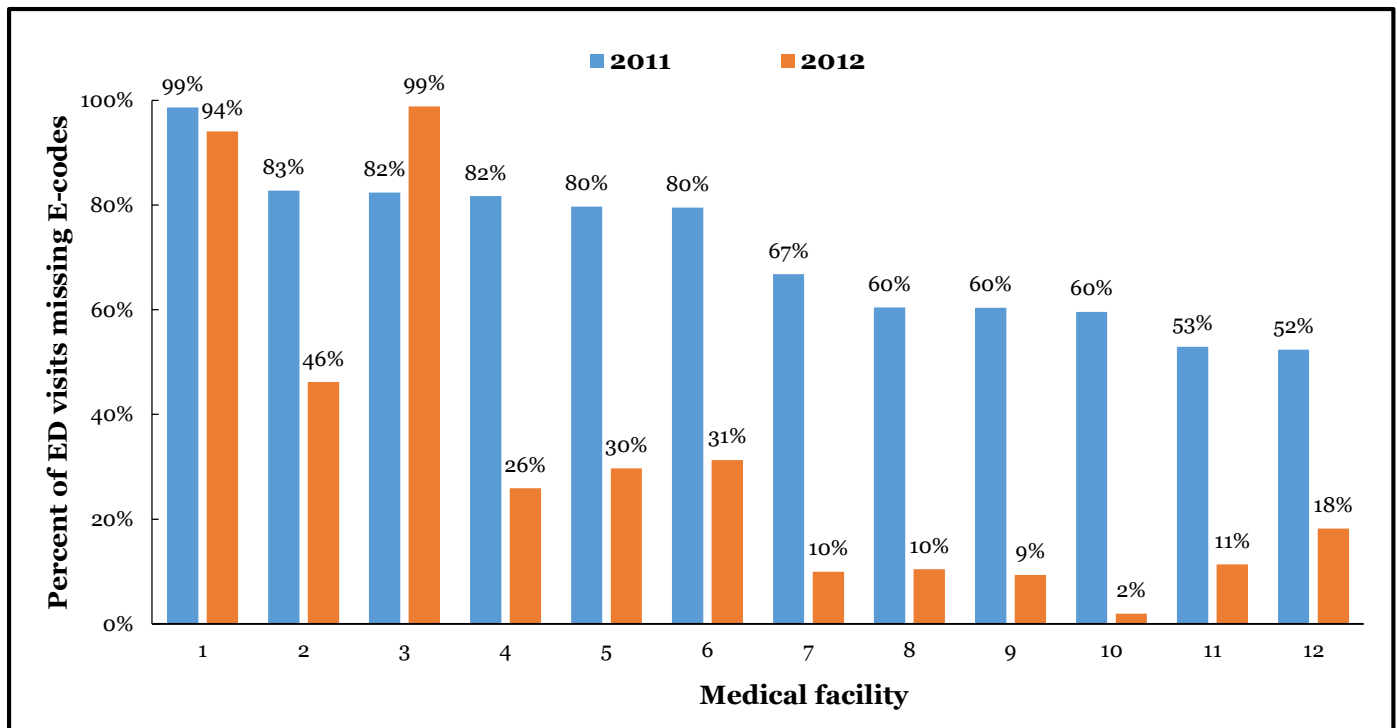


Figure 2. Medical facilities with greater than or equal to 50% of injury-related NC DETECT ED visits missing E-codes in 2011 compared to 2012 data: NC, 2011-2012



Participating Hospitals

The NC SQI team approached hospitals based on the results of the investigation of 2011-2012 NC DETECT ED data. For hospitals with poor reporting of E-codes to NC DETECT, CCHI alerted hospitals to the problem as well as assisted them with efforts to improve E-coding. For the 108 hospitals with greater than 75% E-coding of injury-related ED visits, NC SQI approached the best performing facilities for participation in medical coder interviews.

As of June 30, 2014, NC SQI, in partnership with NCHA, had approached eleven hospital systems for participation in medical coder interviews. Only four of these systems agreed to participate in interviews (36%). Three out of the four systems were teaching facilities (75%). We Coders were interviewed from multiple facilities within each hospital system, except for Hospital System A where NC SQI interviewed coders from only one facility within the system. One hospital system served a primarily urban and suburban population (Hospital System A), while two systems contained facilities serving urban, suburban, and rural areas (Hospital Systems B and C). One system served a mostly rural population (Hospital System D).

Table 2 displays some descriptive information about these hospital systems as of December 31, 2012. Since this date, all systems have acquired additional facilities and Hospital System C lost one facility to hospital closure. Most of these systems shared coders between facilities; at least two of the systems were in the process of centralizing coding for all system facilities. Most of the medical facilities represented in this study were medium-to-large sized hospitals; however, there were a few small, rural hospitals included in the sample. The percent of ED visits with injury diagnosis codes that were missing E-codes ranged from 5%-10% across hospital systems; some facilities within these systems were missing E-codes for only 2% of injury-related ED visits.

Table 2. Characteristics of hospital systems participating in medical coder interviews: NC DETECT ED data, 2012¹

Hospital System	Total no. of ED visits	Average no. of daily ED visits	Range of average no. of daily ED visits by facility	No. of injury-related ED visits	Average % missing E-codes	Range of % missing E-codes by facility
A	65,463	179	179-179	12,509	8%	8% - 8%
B	537,862	211	96-318	105,512	5%	2% - 11%
C	238,341	101	15-309	48,944	8%	2% - 10%
D	110,808	82	40-183	24,273	10%	2% - 14%

¹Defined as an ED visit with an ICD-9-CM diagnosis code in the range of 800-999 (excluding code 995.9)

Description of Medical Coders

The NC SQI team interviewed a total of 18 medical coders from the four hospital systems. These coders represented the ED, inpatient, and outpatient coding. Some coders performed only one type of coding (e.g. inpatient) while others shared roles (i.e. inpatient and outpatient coding). Most of the coders worked off-site, but traveled on-site to participate in functions such as training. Nearly all coders were members of national and local chapters of one or more of the following professional organizations: the American Health Information Management Association (AHIMA) and the American Academy of Professional Coders (AAPC). In general, all coders had a minimum of a high school diploma or equivalent and had completed an accredited education program. In addition, most coders had multiple certifications (such as Registered Health Information Technician or RHIT) and engaged in extensive continuing education. Many medical coders had prior health care experience

and education and were originally trained as nurses, paramedics, or other healthcare professions before electing to work in medical coding and billing.

Initial Clinician Documentation

The majority of interviewed coders cited clinician documentation as the most important factor for complete, accurate, and specific coding. All of the hospitals systems that participated in the project documented patient histories and physical exams in electronic health records. Typically, the software used for electronic documentation utilized free text, check-lists, or drop-down menus for documenting patient information. Two of the four hospital systems were in the process of transitioning (or had recently transitioned) to Epic Systems for electronic documentation. A third hospital system also underwent a major upgrade to their system over the study period. Epic Systems uses a health record that employs a set of customizable text templates and drop-down menus rather than either checklists or free text. According to Epic, these features provide clinicians greater freedom to document those aspects of the case they feel to be most pertinent; however, this may lead to more variability in the types of information included in the health record as compared to check lists. Other features of Epic that have led to its widespread adoption across NC (and the US) includes compliance with “Meaningful Use” as required by the American Recovery and Reinvestment Act (ARRA) and for the transition to *International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM)* in 2015.²¹

According to coders, the detail available through clinical documentation is not consistent across physicians. According to coders at Hospital System B, the best way to improve documentation is to train physicians and physician’s assistants early in their careers to provide clear and detailed information with minimal use of medical jargon and abbreviations in the electronic health record. Hospital System B has a training program for medical residents to learn about coding directly from the medical coders. Coders felt that documentation will likely improve over the next few years as a result of physician-education for the implementation of *ICD-10-CM* in 2015.

E-Code Assignment

All interviewed medical coders regularly assigned E-codes to ED visits with injury diagnosis codes in the range of 800-999 as per coding guidelines; however, not all coders were aware of the usefulness of E-codes for injury surveillance purposes. One coder admitted that she was not certain why E-codes were part of the medical documentation, but she always included them where applicable in accordance with coding guidelines. Other coders felt that E-codes were an important part of telling the patient’s “whole story.” A few coders specifically cited E-codes as an important source of information for researchers and for developing injury prevention strategies.

Medical coders use clinician documentation as their primary reference for coding patient ED visits and hospitalizations. Medical coders cannot use toxicology reports and nurses’ notes as primary sources for medical coding. As mentioned in the previous section, poor clinician documentation was the single largest barrier to complete, accurate, and specific E-coding according to the medical coders. For reasons that are not completely clear, patients admitted to the hospital from the ED tended to have less information about the ED visit documented, thus limiting the assignment of E-codes for these patients. All coders mentioned ways of communicating problems with clinical documentation to physicians through such means as telephone service lines, email, and direct communication through the Epic Systems portal. In general, medical coders do not attempt to contact the clinician unless absolutely necessary. It would be unlikely for a coder to contact a clinician in regards to the assignment of an E-code; priority is given to codes and procedures that are reimbursable. Unclear

documentation for injuries is often the reason why ED visits contain E-codes that refer to injuries of “undetermined intent” and injuries with “other/unspecified” mechanisms.

Medical coders often use electronic coding software for assistance in coding cases quickly and more accurately. Typically coding software is either “book-based” or “logic-based.” Coders from three of the four hospital systems used the 3M™ Coding and Reimbursement System and the 3M™ Coding Reference software for assigning codes. The basic 3M™ Coding Reference software contains *American Hospital Association (AHA) Coding Clinic for ICD-9-CM*, *American Medical Association’s CPT® Assistant*, *Clinical Pharmacology*, *Dorland’s Medical Dictionary*, and *Elsevier’s Anatomy Plates*; other reference sources are available as extensions to the basic package.²² Some coders used additional software to assist with coding ED visits and hospitalizations. 3M™ software is used by the majority of hospitals in NC. One coder at Hospital System A walked the NC SQI team through a hypothetical example using 3M™ ClinTrac™ APC Pro Ambulatory Management Software (APC Pro) for outpatient data. In routine cases, APC Pro prompts the coder to provide information about the case through an initial keyword and a subsequent series of iterative multiple choice text menus. The software then directs the coder to particular *ICD-9-CM* codes and then fills in the codes in the appropriate order into the submission form. Not all medical coders use 3M™ software; Hospital System D uses TruCode™ software. Hospital System D switched from 3M™ software to TruCode™ software because they found it to be more economical and prevented coders from becoming too reliant on the software. Other software packages that coders had familiarity working with were Optum™ and Quadramed™. All medical coders reiterated that the coding guidelines are the ultimate resource for coding. If the software contradicts the coding guidelines, it is important to always trust the guidelines as well as personal expertise. All coders felt that the electronic software played an important supporting role; however, all coders had the ability to override the software if necessary.

According to the medical coders and coding guidelines, diagnosis codes should be listed in order of precedence; often the first-listed code is the injury diagnosis code. In general, medical coders assign diagnosis codes for chronic diseases and substance abuse in secondary positions (unless these conditions were the primary reason for the visit). Coders never list E-codes in the first position. Coders may use multiple E-codes for an ED visit. If two or more mechanisms result in separate injuries, E-codes should be listed in order of the mechanism that caused the most serious injury. Sometimes there are exceptions; for example, E-codes indicating child abuse should take priority over all other E-codes. If documentation is present, ED visits should include a code for the place of occurrence of the injury (E849), the status of the patient at the time of the event (E000), and/or the activity that precipitated the injury (E001-E030). These “non-injury” E-codes should be listed after the E-code indicating the injury mechanism. Coders representing Hospital System B stated that they strive to assign at least four E-codes (injury mechanism, place of occurrence, external cause status, and activity) whenever possible. Information from prior ED visits can inform coding. In general, repeat visits for an injury do not receive an E-code.

Medical coding can be a time-consuming process, especially for complex cases with multiple comorbidities. Overall, inpatient coding tended to be more laborious than outpatient coding. At Hospital System B, coders were expected to average about two or three inpatient records per hour and about five outpatient records per hour. At Hospital System C, coders averaged about 14 inpatient records per day. Medical coders who had supervisory roles (such as auditing) typically handled a lower case-load. That said, there can be a lot of variability in the time it can take a coder to complete a case. For example, the assignment of codes to a patient presenting with a simple fracture of the tibia following a fall would be expected to take less time than the assignment of codes to a patient presenting unconscious with multiple traumatic injuries following a motor vehicle collision. Not all injuries are of equal difficulty of coding. Although it was somewhat coder specific, various coders

mentioned “sports-related injuries,” “ATV-related injuries,” “multi-site trauma and fractures,” “falls,” and “facial injuries” as having the potential for being more difficult to code than other types of injuries. Hospital Systems B and C had a policy of assigning the most complicated cases (and those receiving the highest levels of reimbursement) to the most experienced coders.

All hospitals systems had procedures in place to insure that coders were fulfilling professional expectations. All hospital systems performed annual or semi-annual audits of coders by upper-level management. If problems were identified, management provided additional training. Hospital Systems B and C had protocols of pairing experienced, high-performing coders or auditors one-on-one with lower-performing coders for educational purposes. All coders had a high degree of pride in their respective institutions and strived to exceed expectations whenever possible. In addition to audits, coders may receive pushback from the Patient Accounts department for cases that do not appear to be coded completely. For instance, one coder recounted a recent case in which an insurance company initially refused to pay for anti-insulin antibody treatment because a diabetes mellitus code was not assigned to the visit, despite evidence that the patient was diabetic. Few coders could recount instances in which they received queries from billing over the presence/absence of E-codes; this is not surprising, since E-codes are not directly reimbursable. However, Hospital System D related an occurrence in which an E-code was requested for a patient injured in a motor vehicle collision in which auto insurance was the payor for reimbursement.

Transition to ICD-10-CM

In 2015, medical coders will transition to using *ICD-10-CM* instead of *ICD-9-CM*. Although the transition to *ICD-10-CM* was postponed from 2014 to 2015, all of the hospital systems have engaged in extensive training to prepare for the switch. Most hospital systems contracted with external parties to provide training for *ICD-10-CM*. At least one hospital system had completed their *ICD-10-CM* course-work at the time of the interview. All hospitals systems had plans to dual-code before the transition to *ICD-10-CM*; however, many of these plans did not proceed as expected after the postponement of the transition. Due to the delay, many insurance companies have decided not to cooperate with hospitals in dual-coding at this time. However, Hospital System C is planning to engage in dual coding independently beginning on October 1, 2014.

All of the medical coders seemed cautiously optimistic about *ICD-10-CM*. As mentioned previously, coders hoped that the *ICD-10-CM* training provided to clinicians would lead to improved documentation. The coders felt that the additional level of detail could be both a help and a hindrance for injury coding. On one-hand, *ICD-10-CM* contains codes for injury mechanisms that are not present in *ICD-9-CM*; this should lead to a decrease in the number of cases that are labeled with “other specified injury” E-codes. In addition, some coders felt that the coding for certain types of injuries, such as falls, was more intuitive in *ICD-10-CM* than *ICD-9-CM*. On the other-hand, the considerable increase in the number of codes, including injury codes, could complicate coding.

Discussion

This investigation demonstrated that, while there are multiple barriers to the reporting of complete and accurate E-codes, there is consistent medical coder motivation to accurately document such codes.

Barriers to E-coding

Over the course of the investigation, the NC SQI research team determined that the single greatest hindrance to the complete, accurate, and specific E-coding of injuries was clinician documentation. The primary focus of an ED doctor is to treat and stabilize the patient; clinical documentation for billing is not, and should not be, an immediate priority; however, documentation is important for timely reimbursement of services. Medical coders can only code what is specified in the health record; if the documentation for the injury mechanism is not present, then coders may have no other option than to use non-specific E-codes, such as E928.9 – unspecified accident. Medical coders are also limited to certain sections of the health record for use when coding. For example, coders cannot code directly from the nurse's notes as nurses cannot provide an official diagnosis of disease or injury. Often information about the mechanism of injury is included in the ED chief complaint and/or triage nurse's note since these capture patient information at the beginning of the ED visit and include the reason for the visit and recent history of the illness or injury. Understanding that coders cannot use the information in these two important data elements because they are recorded by nursing, rather than physician or physician extender staff, is important in characterizing why we often see mechanism of injury information in the ED visit record that is not reflected in the *ICD-9-CM* coding. In addition, medical coders may not code directly from laboratory, x-ray, pathologic, toxicological, and other diagnostic results for inpatient visits unless the physician directly refers to these results in their documentation (rules may differ somewhat for outpatient visits). Medical coders may code from consulting physicians and anesthesiologists as long as their reports do not conflict with the attending physician; if there is conflicting information, the coder may query the attending physician for clarification. Coders may obtain body mass index (BMI) from dietician's notes, but coders may not classify the patient as overweight or obese unless this information is documented by the physician.²³ Although these rules may seem somewhat arcane to the lay-person, these rules are intended to prevent incorrect coding of patient visits. Although medical coders have the ability to query physicians about confusing or conflicting information in the health record, medical coders are reluctant to query physicians about injury mechanisms since E-codes are not directly reimbursable.

Recommendations

Based on the medical coder interviews, improving clinician documentation appears to be the best method for improving injury coding as well as coding overall. All of the medical coders felt that physician training was important, especially for recent medical school graduates. It is important that physicians understand the need to be clear, concise, thorough (especially in recording patient history and pertinent comorbidities), to avoid unnecessary abbreviations and jargon, and to identify the principal diagnosis as well as any secondary diagnoses.²⁴ All four hospital systems had different ways of facilitating communication between coders and physicians; however, some coders expressed reluctance about querying physicians too frequently, even when documentation was clearly lacking. To avoid potential conflicts, AHRQ recommends that hospitals “establish an effective process that CDI specialists and coders can use to obtain clarification from physicians on documentation issues that may affect the coding process”.²⁴

Although all interviewed coders routinely assigned E-codes to injury-related visits, few coders had a thorough understanding of how E-codes are used to aid public health professionals in conducting injury research and surveillance. The NC SQI team hopes to raise awareness about the importance of injury coding through continued outreach to medical coders and providing presentations at local and

regional chapter meetings of professional coding organizations. Interviewed coders mentioned that they were interested in learning more about how E-codes are used for injury prevention and policy development. Coders were receptive to examples provided by the NC SQI project team. For example, the coders were interested to learn of the use of NC DETECT ED data for motorcycle crash surveillance as one of the many means used to persuade NC legislators to maintain NC's comprehensive motorcycle helmet law. Historically, NC DPH has not had a close relationship with medical coding organizations, but the NC SQI team would like to foster a partnership between medical coders and the state.

Next Steps

The NC SQI project expects to be funded through July 2016. As of June 30, 2014, NC SQI has only interviewed medical coders from four hospital systems but the project team would like to interview more coders from other systems. In particular, NC SQI would like to interview medical coders from smaller medical facilities as coders from these facilities may face different challenges than coders from large, teaching hospitals. To date, it has been difficult to get smaller hospitals to agree to participate in this discussion, at least in part due to the contracting out of coding services and lack of hospital influence to request coder participation in the interview process.

NC SQI plans to continue to monitor trends in E-coding. Over the last two years, many hospital systems upgraded or switched software to comply with "Meaningful Use" and/or to prepare for the transition to *ICD-10-CM*. In addition, many of the larger hospitals have acquired smaller, community hospitals and have shifted from systems in which individual hospitals performed their own coding to a more centralized system in which coding responsibilities are shared between hospitals. This has contributed to some changes in how data are submitted to NC DETECT. Although CCHI staff have worked closely with the NCHA and hospital information technology (IT) specialists in maintaining the ED data feed to NC DETECT, it is likely that the improvement in E-coding observed in 2012 will not be repeated in 2013 due to challenges encountered as hospitals migrate to new electronic medical information systems.

The NC SQI team plans to continue to use NC DETECT ED data for the development of fact sheets, reports, and national and state presentations as a means of highlighting the utility of NC DETECT ED data for injury surveillance. NC SQI will share the lessons learned from this project with other states that may be interested in conducting a similar project. Lastly, NC SQI hopes to present at local and state medical coder conferences about how the work medical coders do on a day to day basis impacts and informs public health prevention and policy efforts.

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Appendix 1: Questions for Medical Coders

1. What is your job title?
2. Please briefly describe your position:
3. What software do you use for assistance in *ICD-9-CM* coding?
4. What is your understanding of E-codes – what are E-codes and what are E-codes used for?
5. Do you engage in continuing education? If so what type of continuing education (conferences, online classes, etc.)?
6. Are you a member of a state and/or national professional organization for medical coders? If so, which organizations and what role do these organizations play in your professional life?
7. How do you learn about updates to *ICD-9-CM* and how do you handle them?
8. What are some of the most challenging issues that you face in your position?
9. How do you determine the order/positioning of the various diagnosis and E-codes assigned? What gets listed first/primary versus second or lower on the list?
10. To what extent do you rely on the coding software to point to appropriate diagnoses and E-codes based on the medical record documentation?
11. Are you able to check or question codes suggested by the software?
12. Are you able to override the software's code selection for a different code, if you see fit to do so?
13. What are some of the more challenging injuries to code?
14. Please briefly describe how you code drug poisonings/overdoses:
15. How do you determine the intent of the poisoning/overdose (i.e. unintentional versus self-inflicted)?
16. In what situations would you code an ED visits as undetermined?
17. When do you use substance abuse versus drug poisoning/overdose codes?
18. Does the coding software help (or not) with coding poisonings/overdoses?
19. How are you (and/or your team) preparing for the transition to *ICD-10-CM*?
20. In what types of situations do you use activity codes (E001-E030)?